Dynanmic Tracking Of A Nano-Particle In Fluids Under Broenian Motion

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Abstract

Most previous studies on H_2S were devoted to its toxic effects. However, recently there have been increasing evidences which show that endogenously generated H_2S in specific mammalian tissues has some positive physiological effects such as a neuromodulator and vasorelaxant in a membrane receptor-independent manner. In order to know the functions of endogenous H_2S, high accuracy real time non-invasive measurement of low concentration H_2S is necessary. It is reported that low concentration and nano quantity of H_2S can be detected in water solutions and sera using carbon nanotubes with the fluorescence by confocal laser scanning microscopy. However, because of the Brownian motion of the small particle, a control system must be developed to track the movement of the particle in fluids.

In this paper, we present a study to track a carbon nanotube which absorbs H_2S in water or serum using a Raman microscope or confocal laser scanning microscope. In particular, we developed a novel control system for this task. Simulation has shown that our system works very well.